Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1. (Currently Amended) The electrically-pumped THz frequency radiation source of claim 8, wherein the optical gain material is ~~An electrically-pumped terahertz (THz) frequency radiation source comprising:~~

an unstrained bulk optical gain material ~~formed substantially of at least one group IV element and doped with at least one dopant having an intra-center transition frequency in a range of about 0.3THz to 30THz;~~

~~a first electrode electrically coupled to the unstrained bulk optical gain material; and~~

~~a second electrode electrically coupled to the unstrained bulk optical gain material~~.

2. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein the ~~unstrained bulk~~ optical gain material includes at least one of:

a crystalline material formed of one group IV element;

a crystalline material formed of an alloy of group IV elements; or

an amorphous material formed of a group IV element.

3. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein the ~~unstrained bulk~~ optical gain material is selected from a group consisting of: diamond, crystalline silicon, crystalline germanium, crystalline silicon carbide, crystalline silicon germanium, polycrystalline silicon, amorphous diamond, amorphous silicon, and amorphous germanium.

4. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein the first co-dopant ~~at least one dopant~~ is one of a group III element or a group V element.

5. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein the first co-dopant ~~at least one dopant~~ is a shallow depth dopant.

6. (Currently Amended) The electrically-pumped terahertz frequency radiation source of claim ~~1~~8, wherein the first co-dopant ~~at least one dopant~~ is selected from a group consisting of: boron, phosphorus, gallium, antimony, arsenic, and aluminum.

7. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein ~~:~~

~~the at least one dopant includes a first co-dopant of a first carrier type and a second co-dopant of a second carrier type to compensate the first co-dopant; and~~

a first dopant concentration of the first co-dopant is at least five times a second dopant concentration of the second co-dopant.

8. (Previously Presented) An electrically-pumped THz frequency radiation source comprising:

an optical gain material formed substantially of at least one group IV element and doped with at least one dopant having an intra-center transition frequency in a range of about 0.3THz to 30THz,the at least one dopant including;

a first co-dopant of a first carrier type having a first intra-center transition frequency; and

a second co-dopant of the first carrier type having a second intra-center transition frequency;

a first electrode electrically coupled to the optical gain material; and

a second electrode electrically coupled to the optical gain material:

wherein:

a first dopant concentration of the first co-dopant is approximately equal to a second co-dopant concentration of the second dopant; and

the first intra-center transition frequency is not equal to the second intra-center transition frequency.

9. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein a resistivity of the ~~unstrained bulk~~ optical gain material is in the range of about 1 to 10 ohm-cm.

10. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein:

the first electrode is formed of at least one of aluminum, gold, silver, copper, nickel, titanium, tungsten, platinum, germanium, polyaniline, or polysilicon; and

the second electrode is formed of at least one of aluminum, gold, silver, copper, nickel, titanium, tungsten, platinum, germanium, polyaniline, or polysilicon.

11. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein the first electrode forms a Schottky barrier contact with the ~~unstrained bulk~~ optical gain material.

12. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, wherein the first electrode forms a substantially ohmic contact with the ~~unstrained bulk~~ optical gain material.

13. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~1~~8, further comprising:

a first reflective element and a second reflective element substantially parallel to the first reflective element, the first reflective element and the second reflective element being arranged on either side of the ~~unstrained bulk~~ optical gain material to form a Fabry-Perot laser cavity;

wherein;

a reflectivity of the first reflective element is less than 100%; and

the electrically-pumped THz frequency radiation source emits coherent THz frequency radiation through the first reflective element.

14. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~18~~ 8, wherein the ~~unstrained bulk~~ optical gain material is coupled to a substrate.

15. (Currently Amended) The electrically-pumped THz frequency radiation source of claim 14, wherein:

the substrate includes a distributed feedback element;

the distributed feedback element is optically coupled to the ~~unstrained bulk~~ optical gain material; and

the electrically-pumped THz frequency radiation source emits coherent THz frequency radiation.

16. (Currently Amended) The electrically-pumped THz frequency radiation source of claim ~~18~~ 8, wherein the ~~unstrained bulk~~ optical gain material is formed as a doped region within a substantially undoped material formed substantially of at least one group IV element.

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30. (Currently Amended) The electrically-pumped THz frequency radiation source of claim 8, wherein the optical gain material is ~~An electrically-pumped terahertz (THz) frequency radiation source comprising:~~

a bulk amorphous optical gain material ~~formed substantially of at least one group IV element and doped with at least one dopant having an intra-center transition frequency in a range of about 0.3THz to 30THz;~~

~~a first electrode electrically coupled to the bulk amorphous optical gain material; and~~

~~a second electrode electrically coupled to the bulk amorphous optical gain material.~~

31. (Previously Presented) The electrically-pumped THz frequency radiation source of claim 30, wherein the bulk amorphous optical gain material is formed of a group IV element.

32. (Previously Presented) The electrically-pumped THz frequency radiation source of claim 30, wherein the bulk amorphous optical gain material is selected from a group consisting of: amorphous diamond, amorphous silicon, and amorphous germanium.

33. (Previously Presented) The electrically-pumped THz frequency radiation source of claim 30, wherein a resistivity of the bulk amorphous optical gain material is in the range of about 1 to 10 ohm-cm.